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# Update/Le Point

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## WHO Global Oral Data Bank, 1986–96: an overview of oral health surveys at 12 years of age

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*The global oral health situation of 12-year-old children — decayed, missing, filled teeth (DMFT) index and the percentage of population affected — is described in this article using the latest representative studies for 80 countries included in the WHO Global Oral Data Bank (GODB) between 1986 and 1996.*

*The quantity of information varied considerably: 68% of developed market economies had at least one national data set, compared with 38% of developing countries and 36% of economies in transition. By WHO region, the proportions were as follows: Eastern Mediterranean, 55%; European, 50%; Western Pacific, 48%; African, 39%; South-East Asia, 30%; and the Americas, 26%.*

*Globally, the weighted DMFT index for all data in the GODB is <3.0%, the WHO/Fédération Dentaire Internationale goal for the year 2000. For the data reviewed in this article, achievement and nonachievement of this goal are discussed, as is the variation in DMFT means and proportions of children affected for various country groupings. There are difficulties in obtaining recent data for many countries, but the article emphasizes the need to maintain and develop the GODB to facilitate the compilation of valid, reliable and comparable data on oral health.*

### Introduction

The WHO Global Oral Data Bank (GODB) was established in 1969 to meet the need for information on oral health status and disease trends upon which to base WHO's Oral Health programme (ORH). Currently, the GODB contains 1850 data sets on dental caries for 178 countries. Over the years, it has become the main international reference for global oral health epidemiology. Data on oral health are used in a variety of ways: to assess country, regional, and global situations; to guide programmes; and in planning and monitoring (1).

Each data set is checked by WHO for standard criteria and methodology before being accepted for entry into the GODB. The data bank thus satisfies requests for the collection of internationally avail-

able, clearly defined information on oral health (2), and the demand that the collection and presentation of such data be standardized (3). Also, the GODB accumulates relevant information from sources that generally do not appear in the scientific literature, e.g. reports prepared for ministries of health. Furthermore, WHO recommends that countries conduct regular oral health surveys every 5 years if possible, so that changes in oral health patterns and trends can be identified early enough for appropriate and timely planning or replanning of services.

This Update reviews the dental caries data available in the GODB, and which were collected in the period 1986–96 for the index age of 12 years (1). Only national surveys and those regional surveys from which acceptable national estimates could be made were chosen.

### Materials and methods

The information in the GODB is collected from the following sources:

— reports on surveys using the WHO standard epidemiological methods, including those which use

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the pathfinder methodology, as described in *Oral health surveys: basic methods* (4);

- articles on oral health in the MEDLINE database provided that they meet the WHO criteria and methodology requirements and can be summarized in the standard format; and
- official reports from WHO regional offices, ministries of health, and research institutions which use WHO standard methods.

Over the period 1986–96, a total of 307 surveys of 12-year-old children were included in the GODB. These are classified as national surveys, regional or local surveys, or as surveys with only limited information. In this Update we have included from the total set the following types of data:

- national data obtained through random sampling, from national pathfinder studies, or from national registers; and
- regional data considered by local authorities and WHO to be adequate as a basis for reliable national estimates.

If more than one survey fulfilled these criteria for any country only the latest is cited here.

Data presented include the percentage of the sample affected, the decayed, missing, filled teeth (DMFT) index and, if available, its decayed teeth (DT), missing teeth (MT) and filled teeth (FT) components. Two classifications of Member States have been used to present the data. First, by WHO region: African, the Americas, Eastern Mediterranean, European, South-East Asia, and Western Pacific, and second, according to the criteria in the *World economic and social survey 1994* (5), in which countries are classified as developing, developed market economies, or economies in transition.

## Results

### *Representative oral health surveys at 12 years of age in the GODB*

Of the 307 surveys included in the GODB over the period 1986–96, 80 are reported here and provide data for 42% of WHO Member States. Originally, Member States in the GODB were subdivided simply as developing or highly industrialized, a classification that highlighted sharp contrasts in caries prevalence and trends. The more recent economic classification into three categories has further sharpened these contrasts. Subdividing the data according to country category, the 17 surveys from developed market economies represent 68% of these countries

and the data from the eight countries with economies in transition represent 36% of such countries. Without subdividing developing countries into least developed and other developing categories, the 55 surveys from developing countries represent 38% of these countries. Fig. 1 shows the proportion of countries with representative data, by WHO region.

In the African Region the studies reviewed represent mostly eastern, western and southern Africa; the land-locked countries are poorly represented.

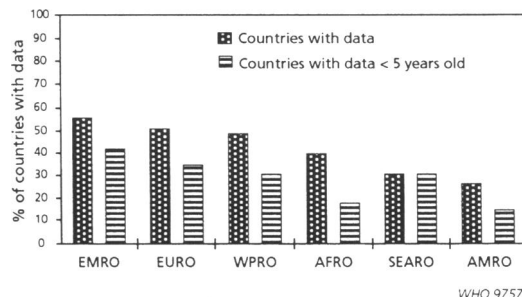
In the Region of the Americas smaller nations, e.g., the Caribbean countries, were best represented, presumably due to the lower complexity and cost of obtaining a national estimate than nations with large populations, irrespective of GNP.

The Eastern Mediterranean Region provided the largest proportion of national data sets (55%), 75% of which were collected over the period 1991–96 and 42% came from pathfinder surveys.

For the European Region the total number of national and national pathfinder surveys, or data sets from national boards of health, was 35. For eastern Europe nine countries had national data sets, of which 89% were collected using the pathfinder methodology. Most of the population of northern Europe is subject to national medical registration; therefore, the majority of countries in northern Europe are represented in recent GODB data. The situation in other parts of Europe is more complicated. There are no recent data for Italy, while data for the former Yugoslavia and Turkey are for 1986 and 1987, respectively. In western Europe reasonable estimates of the caries prevalence among 12-year-olds can be made owing to well-designed studies in Austria, Belgium, France, and Switzerland. National data were not available for Germany, Luxembourg, or the Netherlands for the period covered.

The South-East Asia Region has the fewest Member States of all the WHO regions by a large

Fig. 1. Proportion of countries with representative data on dental caries at age 12 years, by WHO region.



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margin and, therefore, the total of three data sets from this region is no more sparse, in percentage terms, than the nine sets for the Region of the Americas. However, it is the paucity of data from the larger countries that is a greater concern; for example India — projected to become the world's most populous country — Indonesia, and Bangladesh.

In the Western Pacific Region, national data for China obtained using a random sampling methodology were available from 1987. Japan has conducted national oral health surveys every 6 years, the latest being in 1993. Australia and New Zealand provide oral health statistics regularly using random sampling methodologies. Between 1986 and 1996 Australia carried out four national studies and New Zealand, two. Of the island nations in Melanesia, Micronesia and Polynesia, only Kiribati, Samoa, Tonga, and Vanuatu are covered.

### Prevalence of caries at 12 years of age

Of the 80 countries with national data, 60 (75%) had average DMFTs  $\leq 3.0$ , the WHO/Fédération Dentaire Internationale (FDI) goal for 12-year-olds for the year 2000. A total of 44 developing countries out of 55 had average DMFTs  $\leq 3.0$  (80%). Of the 17 developed market economies, 14 (82%) had achieved this goal, sharply contrasting with only 2 (25%) of the 8 economies in transition.

The mean DMFTs for the data for the African Region (Table 1) varied from 3.1 in Madagascar, the

only mean that exceeded the global goal, to 0.3 in the United Republic of Tanzania. Three groups of countries could be identified. The island countries (Cape Verde, Madagascar, Mauritius) had a mean caries level well above the average; Algeria, Burkina Faso, Niger and South Africa had slightly higher caries levels than average; and the other countries had mean DMFT indices ranging from 0.3 to 1.4. According to the WHO classification of mean DMFTs at 12 years of age, six of these countries were in the very low category (0.0–1.1), nine were in the low category (1.2–2.6), and three were in the moderate category (2.7–4.4). As expected, the FT component was low for African countries.

Table 2 shows the caries prevalence data for the WHO Region of the Americas. In the Caribbean area there was a marked difference in DMFT scores, varying from 5.5 (Grenada) to 0.7 (Antigua) as well as in the proportion affected, varying from 90% (El Salvador, Grenada) to 38% (Antigua). Only four of the mean DMFTs were  $< 3.0$ .

For the Eastern Mediterranean Region (Table 3), seven of the 12 mean DMFTs cluster around a median value of 1.6 DMFT. The extremes were DMFT = 0.4 for Djibouti and DMFT = 5.7 for Lebanon (93% of 12-year-olds affected). Eight of the Member States had a low level of caries (DMFT = 1.2–2.6). Altogether, 75% of the countries had a mean DMFT  $\leq 3.0$ , and only Jordan, Lebanon, and Yemen reported a mean DMFT  $> 3.0$ , associated with low caries-free percentages (7–21%).

Table 1: Caries prevalence at age 12 years, WHO African Region, 1986–96

| Country                     | Survey <sup>a</sup> | Year    | <i>n</i> | % Affected      | DMFT <sup>b</sup> | DT <sup>c</sup> | MT <sup>d</sup> | FT <sup>e</sup> |
|-----------------------------|---------------------|---------|----------|-----------------|-------------------|-----------------|-----------------|-----------------|
| Algeria                     | R                   | 1987    | 108      | NA <sup>f</sup> | 1.6               | 1.5             | 0.1             | 0.0             |
| Benin                       | NP                  | 1994    | 1 001    | 33              | 0.7               | 0.7             | 0.0             | 0.0             |
| Burkina Faso                | R                   | 1993    | 300      | 50              | 1.7               | 1.7             | 0.0             | 0.0             |
| Cape Verde                  | NR                  | 1989    | 282      | 78              | 2.8               | 2.6             | 0.2             | 0.0             |
| Ghana                       | R                   | 1989    | 1 493    | 20              | 0.4               | 0.4             | 0.0             | 0.0             |
| Lesotho                     | R                   | 1991    | 354      | 20              | 0.4               | 0.3             | 0.0             | 0.0             |
| Madagascar                  | NP                  | 1992–93 | 1 992    | 75              | 3.1               | 3.0             | 0.1             | 0.0             |
| Malawi                      | R                   | 1988    | 359      | 35              | 0.8               | 0.8             | 0.0             | 0.0             |
| Mauritius                   | R                   | 1990    | 338      | 78              | 2.8               | 1.2             | 0.3             | 1.3             |
| Namibia                     | NP                  | 1991    | 758      | 44              | 1.2               | 0.9             | 0.2             | 0.1             |
| Niger                       | NP                  | 1988    | 619      | 60              | 1.7               | 1.7             | 0.0             | 0.0             |
| Nigeria                     | NP                  | 1994    | 447      | 30              | 0.7               | 0.6             | 0.0             | 0.0             |
| Rwanda                      | R                   | 1986    | 428      | 53              | 1.4               | 1.3             | 0.0             | 0.0             |
| Senegal                     | NP                  | 1994    | 300      | 53              | 1.2               | 1.1             | 0.1             | 0.0             |
| Sierra Leone                | R                   | 1986    | 202      | 56              | 1.3               | 1.3             | 0.0             | 0.0             |
| South Africa                | NR                  | 1988–89 | 5 252    | 56              | 1.8               | NA              | NA              | NA              |
| United Republic of Tanzania | R                   | 1994    | 1 114    | NA              | 0.3               | 0.3             | 0.0             | 0.0             |
| Zimbabwe                    | NP                  | 1986    | 1 008    | 47              | 1.2               | 1.1             | 0.0             | 0.1             |

<sup>a</sup> NR = national data, random sample; NP = national pathfinder study; R = regional data providing national estimate.

<sup>b</sup> DMFT = decayed, missing, filled teeth.

<sup>c</sup> DT = decayed teeth.

<sup>d</sup> MT = missing teeth.

<sup>e</sup> FT = filled teeth.

<sup>f</sup> NA = data not available.

Table 2: Caries prevalence at age 12 years, WHO Region of the Americas, 1986–96

| Country                        | Survey <sup>a</sup> | Year    | <i>n</i> | % Affected      | DMFT <sup>b</sup> | DT <sup>c</sup> | MT <sup>d</sup> | FT <sup>e</sup> |
|--------------------------------|---------------------|---------|----------|-----------------|-------------------|-----------------|-----------------|-----------------|
| Antigua                        | R                   | 1988–89 | 400      | 38              | 0.7               | 0.5             | 0.1             | 0.1             |
| Brazil                         | NR                  | 1993    | 3 407    | NA <sup>f</sup> | 4.9               | NA              | NA              | NA              |
| Dominica                       | NR                  | 1989    | 442      | 69              | 2.5               | 2.1             | 0.2             | 0.2             |
| El Salvador                    | NP                  | 1989    | 857      | 90              | 5.1               | 4.7             | 0.2             | 0.2             |
| Grenada                        | NP                  | 1991    | 346      | 90              | 5.5               | 5.1             | 0.2             | 0.2             |
| Guyana                         | NR                  | 1995    | 547      | 55              | 1.3               | NA              | NA              | NA              |
| St. Vincent and the Grenadines | NP                  | 1991    | 181      | 82              | 3.2               | NA              | NA              | NA              |
| Uruguay                        | NR                  | 1992    | NA       | NA              | 4.2               | NA              | NA              | NA              |
| USA                            | NR                  | 1986–87 | 3 186    | 58              | 1.8               | NA              | NA              | NA              |

<sup>a-f</sup> See corresponding footnotes in Table 1.

Table 3: Caries prevalence at age 12 years, WHO Eastern Mediterranean Region, 1986–96

| Country              | Survey <sup>a</sup> | Year | <i>n</i> | % Affected      | DMFT <sup>b</sup> | DT <sup>c</sup> | MT <sup>d</sup> | FT <sup>e</sup> |
|----------------------|---------------------|------|----------|-----------------|-------------------|-----------------|-----------------|-----------------|
| Bahrain              | NP                  | 1995 | 300      | 52              | 1.4               | 1.2             | 0.0             | 0.2             |
| Cyprus               | NP                  | 1992 | 491      | 67              | 2.1               | 1.0             | 0.1             | 1.0             |
| Djibouti             | R                   | 1988 | 145      | NA <sup>f</sup> | 0.4               | NA              | NA              | NA              |
| Egypt <sup>g</sup>   | NR                  | 1991 | 4 875    | 48              | 1.2               | 1.0             | 0.1             | 0.1             |
| Jordan               | R                   | 1995 | 280      | 90              | 3.3               | NA              | NA              | 0.1             |
| Lebanon              | NR                  | 1993 | 648      | 93              | 5.7               | 5.1             | 0.2             | 0.3             |
| Morocco              | NR                  | 1991 | 750      | 77              | 2.3               | 2.2             | 0.1             | 0.0             |
| Oman                 | NR                  | 1993 | 3 435    | 58              | 1.5               | NA              | NA              | NA              |
| Pakistan             | NP                  | 1988 | 423      | 48              | 1.2               | 1.0             | 0.1             | 0.1             |
| Tunisia              | NP                  | 1994 | 600      | 48              | 1.3               | 1.2             | 0.1             | 0.0             |
| United Arab Emirates | NR                  | 1995 | 17 521   | NA              | 1.6               | 1.1             | 0.0             | 0.5             |
| Yemen                | NP                  | 1987 | 550      | 79              | 3.1               | 3.0             | 0.0             | 0.1             |

<sup>a-f</sup> See corresponding footnotes in Table 1.

<sup>g</sup> Data are for 12–15-year-olds.

Table 4: Caries prevalence at age 12 years, WHO European Region, 1986–96

| Country            | Survey <sup>a</sup> | Year    | <i>n</i> | % Affected      | DMFT <sup>b</sup> | DT <sup>c</sup> | MT <sup>d</sup> | FT <sup>e</sup> |
|--------------------|---------------------|---------|----------|-----------------|-------------------|-----------------|-----------------|-----------------|
| Austria            | NS                  | 1994    | 491      | NA <sup>f</sup> | 3.0               | NA              | NA              | NA              |
| Belgium            | R                   | 1991    | 3 600    | 75              | 2.7               | 0.7             | 0.1             | 1.9             |
| Czech Republic     | NP                  | 1993    | 593      | 77              | 2.7               | 0.3             | 0.0             | 2.3             |
| Denmark            | NS                  | 1995    | 46 504   | 50              | 1.2               | NA              | NA              | NA              |
| Finland            | NS                  | 1991    | NA       | 70              | 1.2               | NA              | NA              | NA              |
| France             | NR                  | 1993    | 1 331    | 65              | 2.1               | 0.6             | 0.2             | 1.2             |
| Hungary            | NP                  | 1991    | 898      | 90              | 4.3               | 2.0             | 0.3             | 1.9             |
| Iceland            | NP                  | 1996    | NA       | NA              | 1.5               | NA              | NA              | NA              |
| Israel             | NP                  | 1990    | 762      | 79              | 3.0               | NA              | NA              | NA              |
| Latvia             | NP                  | 1993    | 1 180    | 86              | 5.8               | 3.5             | 0.2             | 2.0             |
| Lithuania          | NP                  | 1994    | 1 026    | 88              | 3.8               | NA              | NA              | NA              |
| Norway             | NS                  | 1991    | 48 319   | 77              | 2.3               | 0.8             | 0.0             | 1.5             |
| Poland             | NP                  | 1987    | 1 380    | 90              | 4.4               | 2.7             | 0.1             | 1.6             |
| Portugal           | NP                  | 1989    | 704      | 89              | 3.2               | 2.2             | 0.3             | 0.7             |
| Romania            | NP                  | 1992    | 392      | 91              | 4.0               | NA              | NA              | NA              |
| Russian Federation | R                   | 1989–95 | 5 789    | 88              | 3.7               | 2.0             | 0.1             | 1.6             |
| San Marino         | NR                  | 1987    | 130      | 42              | 3.7               | 1.1             | 0.1             | 2.5             |
| Slovenia           | NP                  | 1993    | 401      | 31              | 2.6               | 0.8             | 0.2             | 1.2             |
| Spain              | NP                  | 1993    | 511      | 68              | 2.3               | 1.3             | 0.1             | 0.9             |
| Sweden             | NS                  | 1994    | 72 709   | 52              | 1.6               | NA              | NA              | NA              |
| Switzerland        | NR                  | 1987–89 | 550      | 62              | 2.0               | 0.5             | 0.0             | 1.5             |
| Turkey             | NP                  | 1987    | 412      | 76              | 2.7               | 2.2             | 0.2             | 0.2             |
| United Kingdom     | NR                  | 1993    | 1 499    | 53              | 1.4               | 0.4             | 0.1             | 0.8             |
| Uzbekistan         | NP                  | 1996    | 1 143    | NA              | 1.3               | 1.1             | 0.2             | 0.0             |
| Former Yugoslavia  | NP                  | 1986    | 301      | 99              | 6.1               | 3.8             | 0.5             | 1.8             |

<sup>a-f</sup> See corresponding footnotes in Table 1. NS = National data from national register.

For the European Region (Table 4) all countries with national data more recent than 1990 had a DMFT  $\leq 3.0$ , except Hungary, Latvia, Lithuania, Romania, and the Russian Federation. All the Nordic countries indicated low caries levels, ranging from 1.2 to 2.3. The observed median for all European countries was 2.7. The DMFT data for western and southern European countries were approximately equal to this value; France (2.1), Switzerland (2.0), and the United Kingdom (1.4) were somewhat lower. The eastern European countries, except the former Yugoslavia (6.1 in 1986), Slovenia (2.6) and Uzbekistan (1.3) had moderate caries levels.

In the South-East Asia Region (Table 5) Nepal, Sri Lanka and Thailand belonged to the low DMFT category (1.2-2.6); the DT component was high.

For the Western Pacific Region (Table 6) the median DMFT value was 1.5. Six countries, including China, were in the very low category, four were in the low category, Japan (3.6) and the Republic of Korea (3.0) had moderate DMFT levels and Brunei Darussalam (4.9) was in the high category.

## Discussion

For the planning and monitoring of oral health care programmes, it is essential to have a basic set of

reference statistics on the oral health status of the population in question. The diversity of the data can be important within the same country in relation to area (urban, periurban, rural) and/or to socioeconomic status (SES). If international comparisons are envisaged, a standard approach is especially important. All these elements justify the central role given by WHO to the GODB.

As part of this role, the initiative was taken more than 20 years ago to develop and use the pathfinder data collection methodology to facilitate regular and standard epidemiological surveys (6). This approach uses a practical survey-sampling methodology that enables statistically significant and clinically relevant information for planning to be obtained at minimum expense. This method is also adaptable to the needs of any country, irrespective of its level of development. A major objective is to provide comparable data, which are reliable, but not more precise than the survey's goals, from community to community and over time.

The criteria for defining a national study must take into account various sampling methods. It is appropriate to review here the basic distinction between the random probability sampling methodology and the WHO pathfinder method, the representativeness of which has been questioned (3), but also defended (7), with the conclusion that it does

Table 5: Caries prevalence at age 12 years, WHO South-East Asia Region, 1986-96

| Country   | Survey <sup>a</sup> | Year    | n     | % Affected | DMFT <sup>b</sup> | DT <sup>c</sup> | MT <sup>d</sup> | FT <sup>e</sup> |
|-----------|---------------------|---------|-------|------------|-------------------|-----------------|-----------------|-----------------|
| Nepal     | R                   | 1994    | 135   | 45         | 1.2               | 1.1             | 0.1             | 0.0             |
| Sri Lanka | NP                  | 1994-95 | 2 000 | 53         | 1.4               | 1.2             | 0.1             | 0.1             |
| Thailand  | NP                  | 1994    | 2 801 | 54         | 1.6               | 1.2             | 0.1             | 0.3             |

<sup>a-e</sup> See corresponding footnotes in Table 1.

Table 6: Caries prevalence at age 12 years, WHO Western Pacific Region, 1986-96

| Country                          | Survey <sup>a</sup> | Year | n      | % Affected      | DMFT <sup>b</sup> | DT <sup>c</sup> | MT <sup>d</sup> | FT <sup>e</sup> |
|----------------------------------|---------------------|------|--------|-----------------|-------------------|-----------------|-----------------|-----------------|
| Australia                        | NR                  | 1993 | 4 780  | 44              | 1.1               | 0.4             | 0.0             | 0.7             |
| Brunei Darussalam                | NP                  | 1987 | 405    | 85              | 4.9               | 3.3             | 0.4             | 1.2             |
| China                            | NR                  | 1987 | 26 268 | NA <sup>f</sup> | 0.9               | NA              | NA              | NA              |
| Japan                            | NR                  | 1993 | 143    | 84              | 3.6               | 1.1             | 0.0             | 2.5             |
| Kiribati                         | NP                  | 1992 | 108    | 28              | 0.7               | 0.5             | 0.1             | 0.1             |
| Lao People's Democratic Republic | NP                  | 1991 | 501    | 61              | 1.9               | 1.9             | 0.0             | 0.0             |
| New Zealand <sup>g</sup>         | NR                  | 1993 | 6 577  | 50              | 1.5               | 0.0             | 0.0             | 1.5             |
| Republic of Korea                | NP                  | 1991 | 600    | 75              | 3.0               | 1.7             | 0.0             | 1.3             |
| Samoa                            | NP                  | 1987 | 670    | NA              | 2.5               | 2.4             | 0.0             | 0.1             |
| Singapore                        | NR                  | 1995 | 449    | 42              | 1.0               | 0.0             | 0.0             | 1.0             |
| Tonga                            | NP                  | 1986 | 1 106  | 8               | 1.0               | 0.7             | 0.1             | 0.2             |
| Vanuatu                          | NP                  | 1991 | 307    | NA              | 1.1               | 1.0             | 0.0             | 0.0             |
| Viet Nam                         | NP                  | 1990 | 300    | 58              | 1.8               | 1.7             | 0.0             | 0.1             |

<sup>a-f</sup> See corresponding footnotes in Table 1.

<sup>g</sup> Data are for 12-13-year-olds.

provide a satisfactory degree of precision on the oral health status of a population for planning purposes. A national pathfinder survey should incorporate sufficient examination sites to cover all important subgroups of the population likely to have different disease levels or risk factors. Whereas the random probability sampling method attempts to represent the whole population by designing a sample that minimizes the likelihood that *any* variation would be overlooked, the pathfinder method defines the minimum number of age groups and clusters that will represent *major* variations of importance for the items surveyed, in order to arrive at a national estimate, using weighting of data when necessary. The representativeness of any sample is also connected to the sample size. The number of individuals recommended per age group for pathfinder surveys in areas with moderate caries prevalence is 300, but varies according to the caries prevalence (very low, low, moderate, high, very high) and the level of precision needed. For the national pathfinder studies in the GODB, 5% had a sample size of <300 subjects.

Based on the information in the GODB, WHO has prepared, each year up to 1996, a document on dental caries at 12 years of age (8), which lists the DMFT level for each of the WHO Member States and thus provides information on the comparative levels and general trends of dental caries. Included are the results of the most representative study for each Member State, subject to confirmation by WHO regional offices. Since the entries may also include regional or subnational data considered to give reasonable approximations of national means, it is important to consult the references cited at the end of the document. In this way the sources of the data can be identified and methodological research can be carried out to evaluate by country and by year the national, regional, or local nature of the reported information.

The main aims of the document, in giving the best and latest estimate of mean national dental caries data, are to provide an approximate global picture and to promote efforts to improve information wherever the data are out of date or insufficiently representative of the national average. If a more rigorous approach is needed the only realistic way is to perform a detailed analysis of the data, as described in this article.

Recently, three publications have presented information collected on oral health and diseases (9–11). In 1996 the European Organization for Caries Research (ORCA) published data on the prevalence and severity of dental caries in 35 European countries for the period 1983–95 (9). A total of 21 national data sets for 11 countries are cited. In a report describing the oral health situation in Africa, DMFT

data at 12 years of age for the period 1980–94 were presented for 15 countries (10). However, it was not possible to identify the references and to classify the data as regional or national, and 13 of the African Region national surveys in the GODB were not cited. The Pan American Health Organization has reported caries results at 12 years of age for 29 countries (11); none of these data are included in the GODB as a national figure. A special issue of the *International dental journal* in 1994 presented caries prevalence data for different countries. The observations reported from Denmark (12), Finland (12), Sweden (12), Switzerland (13) and the United Kingdom (14) are consistent with the data in the GODB. These results are also consistent with those described by Burt (15), whose data were taken from regional or local studies in Canada and the USA, except for those taken from the USA national study of 1986–87. However, the observations on oral health at 12 years of age in China and Africa by Fejerskov et al. (16) were based on sparse data. These authors considered the African Region only through studies in Nigeria, the United Republic of Tanzania, and Uganda, although national data were available in the GODB for 13 African countries.

Of the WHO Member States, 21 carried out more than one national survey in the period 1986–96, but 110 countries performed none. This clearly indicates the absence of recent data for many countries and the inequalities between the different countries and regions regarding the availability of information about the oral health status of populations. The problem was greatest in the South-East Asia Region and the Region of the Americas, whereas the surprisingly low proportion (50%) of national data in European Member States should be qualified in several ways. First, there has been a recent effort to collect national data — 68% of the national studies in our report were carried out within the last 5 years. Second, most of the countries with national data have produced them regularly; for example, France has carried out three national studies in 5 years. Third, the number of countries in Europe has increased considerably since the break-up of the Soviet Union, from 34 countries in 1990 to 53 today. For the countries of the former Soviet Union, the caries statistics were sparse; only Latvia, Lithuania, Russian Federation and Uzbekistan are represented in the data bank. However, the national pathfinder survey series that commenced in 1985 in the Soviet Union and included seven regions, with the results being published regularly by the WHO collaborating centre in Moscow, provide very important information on the seriousness of the oral health situation in economies in transition. For northern European countries, except for the United Kingdom, the prob-

lem is to access the data collected, as they do not always appear in readily available publications. It must finally be underlined that there is a striking lack of recent data on the situation in the world's largest countries. Thus, no up-to-date national data were available for Bangladesh, Brazil, India and Indonesia, all of which figure among the 10 most populous countries in the world.

As would be expected, there were large differences in the sample sizes according to the type of survey and culture, administrative structures, and estimated oral health status. A total of 34% of the national studies had sample sizes >1000 and 13% <300. The Nordic countries provided comprehensive data from service statistics collated by the national boards of health, based on reports covering most individuals in the age cohort under study. The data from these countries are very reliable statistically because of the comprehensive oral health service systems for children from which they are drawn. The median sample size for the African Region was 438 subjects. Unfortunately, recent national studies in Benin (1995) and Zimbabwe (1996) could not be included, since the sample sizes for 12-year-olds were too small for the GODB criteria. In the Western Pacific Region, in a recent national survey in Japan, the sample size at 12 years of age (143 children) was also small, but should be acceptable as it was the result of a highly sophisticated sampling system for all ages that has been performed every 6 years since 1957.

The GODB is currently the only such data bank that can provide standardized information on the oral health status of children; however, it has been somewhat neglected by researchers. The statistics and the summaries are available upon request from WHO and also on the World Wide Web (<http://www.whocollab.odont.lu.se>). It is also possible to formulate more specific research questions using the GODB; this to date has remained largely unexplored. WHO aims to promote the use of this working tool, and in the near future plans to update the GODB on the World Wide Web on a monthly basis. This would enable users to provide rapid feedback on the information available and facilitate transfer of epidemiological data to the GODB.

## Résumé

### Banque de données de l'OMS sur la santé bucco-dentaire, 1986–96: bilan des enquêtes sur la santé bucco-dentaire à 12 ans

L'état de santé bucco-dentaire à 12 ans — déterminé en fonction de l'indice CAO (dents

carriées, absentes ou obturées) et du pourcentage de la population touchée — est décrit dans cet article sur la base des résultats des études représentatives les plus récentes conduites entre 1986 et 1996 pour 80 pays qui contribuent à la banque de données de l'OMS sur la santé bucco-dentaire.

La quantité des informations fournies était extrêmement variable: 68% des pays développés à économie de marché possédaient au moins une série de données nationales, contre 38% des pays en développement et 36% des pays à économie de transition. Par Région de l'OMS, les proportions étaient les suivantes: Méditerranée orientale, 55%; Europe, 50%; Pacifique occidental, 48%; Afrique, 39%; Asie du Sud Est, 30%; et Amériques, 26%.

À l'échelle mondiale, l'indice pondéré de dents CAO pour la totalité des données contenues dans la banque de l'OMS est de moins de 3%, objectif fixé pour l'an 2000 par l'OMS et la Fédération dentaire internationale. Pour les données présentées dans cet article, les auteurs indiquent si cet objectif a été atteint ou non, ainsi que les différentes moyennes de dents CAO et les pourcentages d'enfants touchés pour différents groupes de pays. Il est difficile d'obtenir des données récentes pour de nombreux pays, mais les auteurs soulignent à quel point il est nécessaire de maintenir et de développer la banque de données de l'OMS afin de compiler des données valides, fiables et comparables sur la santé bucco-dentaire.

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